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ARTICLE



# Harnessing technology to enable the flow of professional capital: exploring experiences of professional learning in rural Scotland

Helen Coker 

## ABSTRACT

Technology is becoming ubiquitous in daily life and intertwined with professional practice. With the growing prevalence of online and digital technologies comes an expectation of connectivity but this is not yet consistent in rural areas. For professionals working in rural settings digital technology opens opportunities to connect with their wider professional communities, building social capital and accessing resources and knowledge which build human and decisional capital. This qualitative study captured the experiences of three groups of professionals in rural Scotland. Using thematic analysis of semi-structured interviews with rural professionals the potential of technology to enable the flow of professional capital was explored. Rural professionals stand to gain exponentially from the use of technology for professional learning, but it is not a panacea. The distributed nature of rural professional networks, the breadth of information available online and the influence of technology on interactions are important factors for consideration. This research was carried out before the Covid-19 pandemic which led to many professionals working from home. Following the pandemic many professional learning opportunities have moved online, the experience of rural professionals may foreground some useful considerations for those developing online professional learning.

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## KEYWORDS

Technology; rural professionals; professional learning; professional capital

## Introduction

Professional learning is a key element of the professional experience. Whether it is formal or informal, explicit or implicit (Evans 2019), professionals continue to learn and develop throughout their careers. Previous literature has discussed professional learning in relation to self-directed learning based on learners needs, while professional development has often referred to more formalised training. In practice and policy, professional learning and development are not distinct and often overlap (Prestridge 2019). In this article professional learning refers to both formal and informal learning experiences, encompassing both learning and development. Several models of professional learning exist, broadly defining the purpose of professional learning as skilled professional performance: professional learning is seen to involve values and identity, to integrate formal knowledge into practice and to be a social process (Philpott 2014). The social nature of professional learning highlights the importance of considering the professional community as well as the individual professional. As professionals participate in their professional communities, they aim to enact the values and beliefs of that community (Wenger 1999); their professional identity being inherently connected to the professional community in which they practice. Professionals working in the fields of education, health and business will develop and enhance particular ways of being, enacting the values of their profession and becoming skilled with the tools, physical and cultural (Bruner 1996), with which they practice. Professional communities can be perceived at a number of

levels: teachers are members of the education profession as a whole; including all those involved with schooling, teachers, parents, pupils, university professors, educational psychologists and the various stakeholders who contribute to education. They are also members of the school community who they know on a personal level, the Local Authority community (in Scotland schools are organised geographically into Local Authorities) who they interact with during the school year, discipline or interest communities which can be short or long-lived communities where participants have a shared interest or professional focus, e.g. an Early Literacy working group or a Health and Wellbeing group. Each professional community will impact on the teachers professional learning as they form social spaces in which meaning can be negotiated (Wenger 1999). In this article professional communities are defined as the professionals with whom individuals interact during their professional practice.

Professional communities evolve as their members participate and negotiate the meaning of what it is to 'be' in the community (Wenger 1999). For professionals working on the periphery of a community access to this ongoing negotiation of meaning, through social interactions, may be limited. Opportunities for rurally based teachers to interact with their wider professional community can be constrained due to distance, time and cost (Coker 2019). While rural contexts often have strong local communities and may provide ample opportunity for implicit professional learning, professionals working in rural contexts can be both geographically and professionally isolated from the wider community of practice (Hargreaves *et al.* 2015, Bartlett *et al.* 2018).

Technology is becoming increasingly prevalent in all areas of life and potentially provides a means for those on the periphery to join wider community discourses. Connecting with professional peers using digital platforms has the potential to connect rural professionals with their wider professional communities and enable the flow of professional capital (Hargreaves and Fullan 2012). This study compares the experiences of a group of rurally based education professionals with groups of health and business professionals as digital connectivity is being rolled out in the rural areas in which they practice. The findings highlight both the potential and the challenges in relation to harnessing technology for professional learning in rural settings. The term technology in this study refers to digital and web-based technologies which require an internet connection. The study is exploratory and does not compare types of technology.

### **The rural digital context**

Digital participation has implications for social and economic equality (White 2016). Rural areas, worldwide, have poorer internet connectivity than urban areas due to the physical challenges of geography and sparse populations. The current development of broadband internationally which seeks to provide internet connectivity for all is gradually reaching rural and remote communities. For professionals in these communities connectivity affords opportunities for engagement with alternative forms of professional learning. It also enables new ways to connect to professional communities who were previously geographically distanced and therefore challenging to participate with. Technology and education have the potential to be transformative factors for rural development (Odero and Chinapah 2016) as digital cultures have the potential to overcome the challenges of geographically dispersed professional communities (Green and Reid 2014). Digital spaces mediate interactions and learning experience differently to face-to-face interactions though (Cetina 2008, Conole 2009, Coker 2016), opportunities for professional learning online may afford a very different experience to traditional face-to-face opportunities (Prestridge 2019).

In many countries, an urban-rural digital divide exists (Philip *et al.* 2015, 2017) with work developing the digital infrastructure being ongoing across Europe (European Union 2016). In Scotland, the current roll-out of broadband has seen an increase in connectivity from 4% of the Highlands and Islands – a large rural area – in 2013 to 86% coverage in 2017 (HIE *n.d.*), reflective of other rural areas in Scotland. Rural professionals working in – and across – these areas may not have had access to reliable or consistent connectivity until very recently and some still do not.

Exploring their experiences of professional learning enables understanding of the challenges faced when harnessing technology for effective professional learning.

## Purpose and context of this study

Interviewing professionals from across the Scottish Highlands and Islands this study sought to explore the impact of increased connectivity and access to the internet, which resulted from the roll-out of rural broadband across the region. Drawing on the experiences of professionals from three sectors – Education, Health and Business – the experiences of rural professionals in relation to professional learning and their use of technology was explored. Using the theoretical framework of professional capital (Hargreaves and Fullan 2012), participants experiences with technology – in relation to professional learning – were analysed. As technology becomes ubiquitous and urban areas continue to upgrade the quality of their connectivity, it is important to remember that digital equity is not yet a reality for all and in some rural areas connectivity will always pose a challenge (White 2016).

## The participants and their context

The experiences of three groups of rural professionals were compared: The largest group were education professionals; teachers and head teachers working in schools or seconded to local authorities in rural Scotland. Reflective of the international literature, issues with rural education such as urban-centric curricular and policy (Howley and Howley 2014, Roberts 2017), tensions between local and national standards (Gullov 2017), or the repeatedly observed 'leaving discourse' (Baek 2016, Bagley 2017, Corbett and Gardner 2017) were anecdotally observed in rural Scotland. The second group were health professionals; clinicians and educators working in rural areas. The third group were business professionals who also worked in rural areas. For the purpose of this research '*professional*' was initially defined as working in a role which required an entry qualification and further engagement with formal learning or development as careers progressed. The business professionals were not all working in roles which required a specific entry qualification due to the nature of their professional journeys, but ongoing professional development or learning was a requirement.

The research focused on engagement with digital technology for professional learning by rural professionals in Scotland. Scotland's connectivity reflects the urban-rural digital divide observed internationally (Odero and Chinapah 2016, Philip *et al.* 2017). The area around the cities of Edinburgh and Glasgow – known as the Central belt – has good internet connectivity compared with the rural areas to the north and west. The north and west of Scotland are the highlands and islands of the country. There are a few small cities but the majority of the area is made up of small and often remote towns, villages and crofts. The Scottish government six-fold rural urban classification defines Scottish rurality and has been used in this study. Participants were recruited from rural and remote areas in the north and west of the country, 4, 5 and 6 of the Scottish government classifications (Figure 1):

Education professionals in the study were all working for schools or local authorities in rural or remote settings. Schools were generally small, with multi-grade or composite classes in primary settings. In secondary schools teachers were likely to be working in small or single teacher departments. For health professionals in the study clinicians generally worked alone covering large rural areas and driving between multiple clinics. Three of the health professionals interviewed led teams and had a responsibility for enabling professional learning. The business professionals interviewed all worked in small or single-person businesses. The interviews captured a range of experiences, from those who were at the beginning of their career to those about to retire. In the health and education sectors there was an even spread between those who had grown up in rural areas and those who had moved to a rural area. For the

<i>Scottish Government 6 fold Urban Rural Classification</i>	
<i>1 Large Urban Areas</i>	<i>Settlements of 125,000 or more people.</i>
<i>2 Other Urban Areas</i>	<i>Settlements of 10,000 to 124,999 people.</i>
<i>3 Accessible Small Towns</i>	<i>Settlements of 3,000 to 9,999 people and within 30 minutes drive of a settlement of 10,000 or more.</i>
<i>4 Remote Small Towns</i>	<i>Settlements of 3,000 to 9,999 people and with a drive time of over 30 minutes to a settlement of 10,000 or more.</i>
<i>5 Accessible Rural</i>	<i>Areas with a population of less than 3,000 people, and within a 30 minute drive time of a settlement of 10,000 or more.</i>
<i>6 Remote Rural</i>	<i>Areas with a population of less than 3,000 people, and with a drive time of over 30 minutes to a settlement of 10,000 or more.</i>

**Figure 1.** Six fold urban rural classification (Scottish Government, 2018).

business professionals the majority of participants had always lived in a rural area, with one moving into the rural area and one returning to the rural area, in which they were now situated. For ethical reasons the descriptors are not specific; naming places or specific clinical roles or businesses would break the confidentiality of participants.

## **Theoretical framework**

To explore the experiences of the three groups of rurally based professionals and enable a critical comparison the research engages the theoretical framework of professional capital.

### **Professional capital**

Professional capital – as the structuring theoretical framework – enables a critical comparison of the use of technology by different rurally based professional communities, capturing the social and dynamic nature of professional learning (Hargreaves and Fullan 2012). Applied to the rural setting the potential of technology as a tool to enable the flow of professional capital is highlighted. Technology counters some of the challenges of rural practice and potentially enables professionals ‘to conquer the tyranny of distance and isolation’ (Hargreaves et al. 2015, p. 318). Professional capital draws together three types of capital: social, human and decisional (defined below). Hargreaves and Fullan (2012) argue that ‘the highest performing economies and education systems in the world’ (ibid: 2) adopt and promote professional capital as a strategy for development.

### **Decisional capital**

Decisional capital refers to a professional's ability to '*make discretionary judgements*'; judgements which require independent decision making, sometimes based on uncertain evidence (Hargreaves and Fullan 2012, p. 93). For professionals in rural areas this is a particularly salient element of professional capital as if practising at a distance from their peers they are potentially more likely to encounter instances where decision making is individual. Teachers in rural schools play a wider role (Tieken 2014) and have greater autonomy (Coker 2019) than their urban counterparts. Decisional capital requires professionals to be confident in their understanding of the knowledge and values of their professional community. To do this they require human and social capital.

### **Human capital**

Human capital refers to the individual qualities of professionals; the skills and competencies they bring to their practice (Hargreaves and Fullan 2012). Professionals in rural areas develop human capital from their learning and experience, often initial professional learning requires a move away from the rural setting to an urban University or College. Hargreaves and Fullan (2012) observe that focusing on human capital, in isolation, is unlikely to have beneficial outcomes. Learning is a social process (Bruner 1996, Philpott 2014). In rural areas professionals can feel isolated (Bartlett *et al.* 2018) which may impact on their human capital. Rural settings often face challenges in terms of both recruitment and retention; finding – and keeping – human capital is potentially challenging.

### **Social capital**

Social capital exists in the relationships between people and the access to philosophies, skills and knowledge these afford (Hargreaves and Fullan 2012). Originally derived from the work of Bourdieu (2010) social capital highlights the way in which social spaces are at once structuring of, and structured by, practice. For professionals, communities of practice (Wenger 1999) are dynamic social spaces in which they learn the values, beliefs and ways of 'being' professional, but also which they shape through their participation within them. In rural settings social capital is potentially hindered by the geographical distribution of professional communities (Hargreaves *et al.* 2015) although it has been suggested that isolation is a storyline applied by researchers (Hargreaves 2017) rather than experienced by rural professionals. Using social capital to understand the experiences of rural professionals enables exploration of the dynamics of the rural social space and distributed communities of practice, professional communities where professionals are distributed geographically, often spread over large areas with poor transport links. Technology has the potential to connect rural professionals to their professional peers and wider professional community.

### **Technology**

Technology and education have the potential to be transformative factors for rural development (Odero and Chinapah 2016). The role of the internet has been explored in relation to enabling the flow of social capital in rural settings (Norris 2002) highlighting the potential of technology in enabling interactions between professionals. Technology can provide access to information and resources which may previously have been inaccessible for rural professionals. Engaging with professional capital as a theoretical framework highlights the nuances of professional experience and enables consideration of the role of technology on professional learning in a social context.

Methods

Thirty-two rurally based professionals from three different professions were interviewed. The interviews captured the ‘voice’ of rural professionals, a narrative potentially overlooked in previous research (Hargreaves 2017, Roberts 2017). Using interviews, the qualitative methodology approached the interviews as co-constructions of meaning; focusing on participants’ words, rather than actions (Gubrium and Holstein 2012) and inviting participants to share their personal stories the interviews actively constructed a shared understanding of the experiences of rural professionals (Gubrium and Holstein 1998). The interviews created breadth and depth of evidence, enabling critical engagement with the complex nature of rural living, acknowledging and valuing rural voices (Corbett 2015).

The interviews were carried out in either a face-to-face setting or on the phone lasting between thirty-five minutes and an hour. The majority of interviewees were given a choice and the interview context reflected their preference. For interviewees who were located in remote rural contexts phone interviews were used pragmatically. The interviewees were located across the north and west of Scotland (Figure 2):

Interviewees came from three professional sectors, participants from each of the sectors were distributed across the area shown on Figure 2:

Education professionals	Eighteen interviews
Health professionals	Seven interviews
Business professionals	Seven Interviews
Total	Thirty-two interviews

The style of the interview was semi-structured and narrative (Clandinin 2007) with a loose schedule focusing on areas of interest rather than specific questions. Interviewees were initially asked to share their experiences of working in a rural setting. They were then asked about their experiences of professional learning and finally about their experiences with technology, in the context of professional learning. Interviews were perceived as situated culturally and historically, they were social interactions (Warren 2012) where interviewer and interviewee engaged in the co-construction of meaning (Gubrium and Holstein 1998). They were preceded by an invitation in which participants were asked to talk about their experiences of being a rural professional and about their professional learning. The semi-structured nature aimed to allow the experiences of participants to shape the interviews, rather than the expectations of the interviewer. The assumptions that working in a rural setting is different to an urban one, that professionals do engage in professional learning and that this in some way involves technology, were present in the interview structure.

The interviews were audio recorded and fully transcribed. The transcriptions were sent to the interviewees to be reviewed before submission. This layer of review enabled participants to check their responses in relation to their own experiences. Six of the thirty-two participants made amendments to the scripts. Amendments related to comments in which a person or place could be identified, reflecting professional’s awareness of the lack of anonymity in the rural setting, they did not change the essence of the experiences discussed. Before analysis the transcriptions were anonymised with names of people and places removed – place names were coded so that the analysis could note when a particular place was referred to by different participants. All data were stored securely and destroyed following completion of the study and all evidence was treated respectfully, valuing participant’s time and their willingness to be involved in the study.

Analysis

Analysis was thematic and iterative using an inductive-deductive framework (Fereday and Muir-Cochrane 2006). The data was initially explored as three data sets; education, health and business professionals. The three sets of interviews were coded thematically by a single researcher. First cycle





**Figure 2.** Map showing locations of interviewees (appropriate location to preserve confidentiality).

coding used inductive descriptive and In Vivo coding (Miles *et al.* 2014) to explore the large quantity of data generated by the interviews. The education professional's data set was then coded using second cycle pattern codes which identified themes running through the data-set. Data relating to the themes were collated and each theme was re-visited by returning to the interview transcripts, adding depth to understanding of the theme and identifying any outlying data or anomalies. The approach was purposefully systematic to ensure that the researcher captured all of the participants' voices, the process was a structured co-construction of understanding in which the

coding cycles ensured all data was included. The second cycle coding for the health and business professionals data-sets used the themes, thus making a deductive comparison of these professionals experiences with those of the education professionals. This approach enabled further development of the themes. As the education data-set was the largest set of interviews it formed the foundation for the second cycle coding capturing the widest scope of participant experience. Developing the themes in this way reflected the inductive-deductive methodology (Fereday and Muir-Cochrane 2006) which valued and foregrounded the voices of participants while acknowledging the co-construction process and the researchers active and visible role within the process. The themes which emerged from the second cycle coding were:

- Challenges – Time, Distance and Cost
- Attitude to Professional Learning
- Professional Networks and Professional Dialogue
- Technology – Use, Attitudes and Confidence

Starting with data from the technology theme – the use of, attitudes towards, and confidence with, technology – the researcher used the professional capital theoretical framework to critically analyse the data-set and develop understanding of the role technology plays in professional learning in rural settings.

## Results

The results are organised around the professional capital theoretical framework and organised from least to most important when considered in relation to the use of technology for professional learning. This reflects the quantity of related data in terms of the number of interviews in which it featured and the amount participants spoke about it. The mutually constituting nature of the three types of capital – all are required for the effective development of professional capital – is acknowledged and engaged with in the discussion section. Breaking down the elements for analysis enabled critical reflection on the factors which influence rural professionals' experiences.

### *Decisional capital*

Decisional capital is developed over time through experience and is accentuated by social capital. Technology has the potential to enhance professional practice in providing access to information, creating efficient administrative systems and connecting professionals, thus enabling elements of practice and developing decisional capital. Three key themes were identified which related to decisional capital and technology use in the interviews:

- The current role of technology in practice
- Inconsistent connectivity
- Information overload

Technology was perceived as having the potential to connect people and therefore negate the challenges of distance, cost and time which impact on rural professionals' daily practice. If meetings were facilitated online the need for a three hour journey, an overnight stay and unrealistic time out from daily practice would be negated. More time would be freed up to practice.

The rural context was observed to impact on decisional capital as rural professionals shared their experiences of multiple roles and competing demands. In rural school's teachers have a wider role (Tieken 2014) and in business many people own, or work for, multiple small organisations. The smaller population in rural areas leads to less defined roles or wider coverage of professional practice. Clinicians (health professionals) cover vast geographic areas where populations are

distributed or isolated. Across the three sets of interviews professionals discussed the breadth of their roles, influenced by the distributed population and large geographic spread of the rural setting. Technology was perceived by participants to have potential in relation to supporting practice, rather than being an actuality in doing so.

In education this was exemplified by comments related to the need to develop technology use:

*'I think we need to get better at how we use the video conferencing. It needs to be, well it has to be the way forward I think, because of the sustainability issues'*

for both meetings and more general forms of support:

*'I think we need to investigate and obviously we are investigating, ways to use technology to support people in rural isolated areas'*

The health professionals related varying levels of engagement with technology to support their practice. While some professionals were trialling apps which enabled access to knowledge and support while on visits, others discussed the desire to use technology to support administrative tasks and free up time for professional learning. In business engaging with digital technology was more widely accepted as a key part of a professional role, particularly in relation to accessing professional learning:

*'Yeah potentially it's just a kind of fundamental essential, if you've got a good connection like we've got then we can have the staff all responsible for their own online learning and training and that sort of stuff, without that it becomes much more of a challenge because as I said we don't have any local alternatives'*

While the potential of technology was observed throughout the interviews some resistance was also evident, particularly in relation to the facilitation of professional dialogue (discussed below). A major barrier to engaging with technology was the inconsistent infrastructure. Drawing on all thirty-two interviews the connectivity across rural Scotland was observed to be inconsistent, in some cases locally so.

A third factor which was observed to relate to decisional capital was the filtering of information accessible online. While connectivity enabled access to a wealth of information participants are required to filter it, to engage productively. The smaller size of professional teams, their distributed nature and the time taken up with travel all contributed to less time being available to filter online resources and identify salient ones. For health professionals this was identified as a wider issue and the health board were developing a system to support staff:

*'TURAS is Gaelic for journey. TURAS is a, what is it, the guy who was developing it described it as something like an Amazon in that you go on, it's a platform with lots and lots of learning bits on it and if you pick a particular learning bit, it works out your preferences and highlights - oh you might be interested in this - like Amazon does'*

While filtering online learning resources is potentially an issue for professionals in urban as well as rural areas the factors identified above accentuate it in the rural context, where professionals are more widely spread and have less access to peers whom may share the filtering process. This has the potential to impact on decisional capital as the knowledge required to make decisions may be less accessible. The greater autonomy of the rural professional brings with it a greater individual responsibility in relation to continuous professional learning and development which requires access to new knowledge and practices.

### **Human capital**

Accessing resources and connecting with colleagues highlighted potential benefits of technology use for professionals in rural areas, in relation to developing human capital.

Differences were observed in perceptions of professional learning between the three types of professionals. Education professionals all began their discussion about professional learning with examples of courses or networks organised by local authorities. Access to these was often

constrained by distance, time, cost and lack of supply cover. Twilights sessions provided distinct challenges for teachers based in rural schools at a distance from the session. Initial responses when asked about professional learning predominantly aligned with the transmissive category of CPD (Continuing Professional Development) from Kennedy’s (2014) model for understanding CPD in schools and were maligned with challenges in relation to access. Transformative and malleable types of CPD (Figure 3) were discussed by Education professionals when giving examples of the types of professional learning they were actively engaged with.

Following initial examples of training courses, which were often inaccessible or challenging to attend, they also shared examples of engagement with online professional networks using social media and academic study, professional learning which arguably required greater levels of autonomy and agency. For health professionals a similar structure was observed but here an individual engagement with research, keeping up to date with the latest knowledge and understanding in relation to their discipline, led to professionals individually engaging with the development of their human capital, joining specific online networks, and engaging with the local provision. This contrasted to the discussions with education professionals as health professionals predominantly started discussions on professional learning with transformative examples (Kennedy 2014), where autonomy and agency were visible. For business professionals there was a perceived lack of access to support and so professionals were agentive in exploring the online space as they were generally unable to travel to events. All rural professionals related an increased agency in relation to developing their skills and expertise because of their rural context. Access to information and resources was not equitable across rural areas and so a potential challenge to the development of human capital was observed.

Professional learning, in relation to human capital, can be seen to connect with professional progression. Across the education and health interviews progression opportunities were reported as lacking. In relation to education the geographic spread of schools, and the small professional community combined to present a perceived lack of progression juxtaposed with an active choice to live rurally, this led to a feeling of deficit amongst some rural professionals, in relation to their

Purpose of Model	Examples of Models of CPD which may fit within this category
Transmissive	Training models Deficient models Cascade model
Malleable	Award-bearing models Standards-based models Coaching/mentoring models Community of Practice models
Transformative	Collaborative Professional Inquiry models

Increasing capacity for professional autonomy and teacher agency

Figure 3. Spectrum of CPD models (Kennedy 2014).

opportunities for progression. Moving to a promoted position may require a long wait until a more senior colleague retired, or re-locating. For health professionals many clinicians accepted the lack of career progression as a counter to contributing to a rural community, acknowledging that senior positions were located in urban centres. Rural business professionals described the challenges of running a business in a rural area and the additional time and effort which was required while relating the benefits of living and working rurally in relation to lifestyle choices. Developing and keeping human capital in rural areas potentially requires an understanding of this nuanced perception of rural working. Issues with recruitment and retention of staff to rural areas have been reported in the education and health sectors (Lincoln *et al.* 2014, Hargreaves *et al.* 2015, McNeil *et al.* 2015).

Another facet of human capital which technology creates the need for is proficiency with technology tools. For those facilitating webinars the importance of skilful facilitation was observed:

*'The quality of the person delivering that has to be spot on, and obviously he or she has to know how to use all of this, because if they don't then the experience can be not very good actually'* (Business)

*'Some presenters are not as good at video conferencing, we have had a presenter, doing a video conferencing session, stood with their back to the camera which wasn't great and often the sites do feel like peripheral sites'* (Health)

*'I've used webinars and phone links and stuff like that but they tend to be ... the delivery is a bit sloppy, sometimes the sound link is poor, sometimes there's lots of background noise, they put the microphone by the coffee cups, it's that kind of thing, it's simple things, there could be training, that would improve it in terms of delivery in Education'* (Education)

Good practice in webinar delivery was also reported and professionals in all three areas reported webinars as useful tools, particularly for accessing up to date information about practice. The examples above highlight the need for different types of human capital to be developed in relation to professional learning in rural areas, effective facilitation of webinars could open up opportunities for the development of wider aspects of human capital.

A lack of confidence with technology was reported in many interviews; participants described their own lack of confidence and that of others around them:

*'I mean technology isn't my area of expertise as you can tell that from this and that perhaps reflects the kind of state that we're in when we're using it because the fact that I'm not as fluent when I'm talking about the technology demonstrates'* (Education)

*'She's much younger than I am and I would have thought she'd be comfortable with technology but there are staff who are not comfortable with it'* (Health)

In education a sub-set of skills in relation to technology was observed as missing from the professional community. The lack of confidence in engaging with technology was being accentuated by the prevalence of technology use in schools, with laptops and tablets being provided for pupils. Although contradictory to wider research (Bennett *et al.* 2008) generational change in relation to confidence with technology was observed in the data; in rural schools with smaller teams and fewer younger teachers joining or staying in the schools, the rural context may influence the time it takes for the profession to gain confidence. The development of human capital may be mediated by the rural location. This was reflected in the health interviews as well where poor infrastructure and lack of access to video conferencing facilitates also hampered rural professionals engagement with technology.

### **Social capital**

The importance of professional dialogue and connection to the wider professional community was evident throughout the data. A lack of access to the wider professional community was observed in business to mediate a lack of self-confidence. For rural education professionals a lack of opportunity

for professional dialogue was observed as a frustration. For all professionals the rural context influenced their access to social capital. While strong local relationships were reported, accessing the wider professional community and enabling the flow of social capital across rural contexts brought challenges. Two examples exemplify the potential and the challenge for technology use, one from health and one from education. They relate to the experiences of the majority of participants across the breadth of the data.

Firstly, focusing on the potential of technology the health professionals related their engagement with video conferencing (VC) technology as a way of connecting professional groups. One team facilitated VC huddles regularly to share updates and discuss challenging cases. This enabled the team to develop relationships, share resources and philosophies and through social connections develop professional capital. In another example the facilitator of a VC course located themselves in the peripheral location, VC-ing from there into the city location and connecting with other rural locations. The leader of the team moved between locations for each VC meeting, establishing relationships in person as well as through VC. A rural conference also utilised a VC connection to enable international participation. Cost of travel was a challenge for all three professional groups so the potential of virtual connections is worth exploring. As observed in the section above the importance of facilitation when connecting virtually is a key consideration.

From education the second example presented highlights the danger of poor facilitation, accentuated for those participating in rural or remote locations. A rural teacher reported how they had connected into a session facilitated by the local authority in which the majority of participants were in one room. The facilitator's lack of consideration of those VC-ing in led to the experience accentuating the lack of social capital rather than building it. By watching a group of colleagues engage in collegial activities the participants own isolation was accentuated and they were left feeling alone and disconnected. Many of the participants related their unease with online communications when compared with face to face:

*'It's actually really really difficult because you can't beat the professional connection that you get with people when you physically sit in the same room as them and have a conversation'* (Education)

For professionals who have a lack of professional interaction locally this can be a real challenge:

*'I just really want one of my colleagues take on it. How would you do that and what would you have done and those kinds of things, it's actually not that easy. Yes, you can pick up the phone but other people are busy as well whereas in the much larger school, in a more urban, I might just nip to the next school on my way home, I'll be dropping in on my pal to have a talk about it which is just so much better'* (Education)

Social capital requires more than just talking to another professional. Trust and building relationships are important considerations which are mediated differently when experienced through technology. Excellent examples of collaboration through technology were reported by all three sets of professionals: the development of collegial relationships in mainland and island school staff and pupils in a remote setting, a nationally distributed conference which valued rural voice and access to global networks for business professionals all highlight the potential of technology. The challenges relating to facilitation, skills and infrastructure are important considerations for rural settings. The rural context may amplify these, creating different or nuanced challenges than those posed for professionals in more urban locations.

## Discussion

The purpose of professional learning, broadly, is to develop professional practice (Philpott 2014), both at the level of the individual and the professional community. Digital technology and connectivity have the potential to contribute to this. In providing access to knowledge and to other professionals, digital technology can support the development of decisional, human, and social capital, building professional capital and developing professional practice (Hargreaves and

Fullan 2012). In relation to professional learning in the rural context this research highlights two key considerations:

- (1) Rural professional's access to new knowledge
- (2) The impact of digital technology on social interactions

Rural professional's experiences may offer insights which are useful for the wider population as the Covid-19 pandemic influences working patterns and many types of professional learning are likely to take place online.

### (1) *Rural professional's access to new knowledge*

Professional capital requires access to new knowledge. Accessing new knowledge enables professionals to maintain human capital. Decisional capital often requires professionals to access or work with new knowledge. Social capital enables knowledge – in a range of forms – to flow around communities, building both human and decisional capital. Eraut (2007) discusses knowledge in the workplace in relation to codified and cultural knowledge. Understanding knowledge creation as a social process, codified knowledge is knowledge which has been translated, or codified, the type of knowledge reified in books and journals. Cultural knowledge is uncoded knowledge and '*is acquired informally through participation in social activities; and much is often so "taken for granted" that people are unaware of its influence on their behaviour*' (Eraut 2007). The rural setting may influence both types of knowledge; codified and cultural (Eraut 2014). Accessing codified knowledge may be influenced by distance, time and cost in rural settings. Digital technology has the potential to negate these challenges and provide access to a wide range of codified knowledge.

The smaller professional teams, or lone working style, of many rural professionals, may influence their access to and application of new knowledge in different ways. The inconsistency of connectivity across rural areas is an explicit barrier in accessing this knowledge. As employability increasingly relies on access to digital connectivity (CAS 2018) geographic digital divides (Philip *et al.* 2015) also have the potential to impact rural professionals learning opportunities. Those involved in professional learning provision should be cognisant that connectivity is not universal and for some rural areas will always be limited.

Digital technology provides access to a wide range of codified knowledge. It's role as a mediating artefact, reifying that knowledge is different to traditional print-based texts which – in the context of professional learning – have previously reified codified knowledge. One way in which this difference is experienced by rural professionals is in relation to filtering. The wealth of codified knowledge on the internet is itself a barrier to access when the time required to filter that information is not available. In the context of rural health this was identified as an issue and the TURAS online portal was being developed in response (see Results section). Education, health, and business professionals, even when actively involved with online networks, encountered this issue. The online networks may be assumed to provide a degree of filtering, but they did not eliminate the challenges around filtering and identifying relevant codified knowledge.

Digital technology acts as a mediating artefact (Conole 2009), reifying information in a different way to books and previous literature, where the texts themselves physically 'contained' and filtered knowledge, thus providing relevant codified knowledge in a potentially more accessible form. The processes of gathering and interpreting information by authors, editing by publishers and choosing texts by professional learning providers, are all social processes which change in the online setting. New literacies are developing around the internet (Knobel and Lankshear 2007), reflective of the differences between online and print-based codified knowledge. For rural professionals who are potentially more isolated, in a professional sense, and have less opportunity for explicit social interactions, the loss of these implicit social processes in codifying knowledge and ensuring that it is



relevant to their professional learning, are potentially problematic. The value attributed to professional dialogue reflected the need for explicit social interactions, perhaps amplified by the loss of more implicit social processes as codified knowledge is reified digitally.

### (1) *The impact of digital technology on social interactions*

The social nature of professional learning (Philpott 2014) and the value of social capital (Hargreaves and Fullan 2012) in the professional context highlight the need to consider how technology influences professional interactions for rural professionals. These factors may apply to all professional communities as they begin to interact more commonly in digital contexts. Digital spaces were only occasionally utilised for professional dialogue by the education professionals interviewed in this study. A tacit resistance to online interactions (it's just not the same as face to face) and a potential lack of skill, a subset of technology skills which ensures confidence with the technology and effective utilisation, are barriers to digital dialogue. All three communities of professionals described online interactions as deficit when compared with face-to-face encounters. Digital technology mediated interactions present a challenge to the development of social capital, the nuances of dialogue are not picked up (Beth et. al. 2015) and the subsequent experience feels less 'human'. In education small local school teams provided face-to-face interactions, health professionals using digital connections were working in dispersed teams where there was not a face-to-face alternative. Social capital was perceived to naturally reside and develop through face-to-face interactions. Future research could explore in more detail the mediating role of technology when used to connect distributed teams (as in the case of the health professionals) compared to small, dispersed teams (like the education professionals) as digital connections become more prevalent in professional life. In rural areas professionals who default to face-to-face dialogues have less opportunity to access social capital compared with those in more populated areas, this is therefore a key consideration for rural settings.

In places where the connections are good and rural professionals can attend networks or professional learning sessions, the facilitation of those experiences is an important consideration. The human capital required of the facilitator includes an understanding of the positioning of rural professionals. Interacting at a distance and through technology is experienced differently when compared to face-to-face interactions. When it is perceived to be not as good (when poorly facilitated the experience can be negative) it suggests a lack of value attributed to those in rural settings. While being able to connect to people and access knowledge through technology should provide equity and enable the flow of professional capital, perceptions of technology as second-rate, when compared with traditional networking or professional learning events, position rural professionals in such a way that can accentuate their position on the periphery, rather than connect them to the wider professional discourses. Facilitators who value the contributions of rurally based professionals and actively work to ensure that all can participate in sessions, are more likely to enable the flow of professional capital. Efficiency with the technology – in relation to leading online sessions – is more important for participants who do not have local alternatives. Facilitation is a key factor in relation to harnessing the potential of technology as a means to build professional capital.

## Conclusion

Rural professionals stand to gain exponentially from the use of technology for professional learning. Harnessing technology to enable the flow of professional capital potentially provides equity of access to new knowledge and creates spaces for professional dialogue. In connecting rural professionals to national discourses professional communities stand to gain from innovative and creative approaches. But technology is not a panacea. Consideration of the nuances of the rural lived experience and the nature of distributed networks are key considerations as well as continual development of connectivity, infrastructure and facilitation practices.



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